NEW ZEALAND ANTARCTIC RESEARCH PROGRAMME 1980-81

NEW ZEALAND ANTARCTIC RESEARCH PROGRAMME

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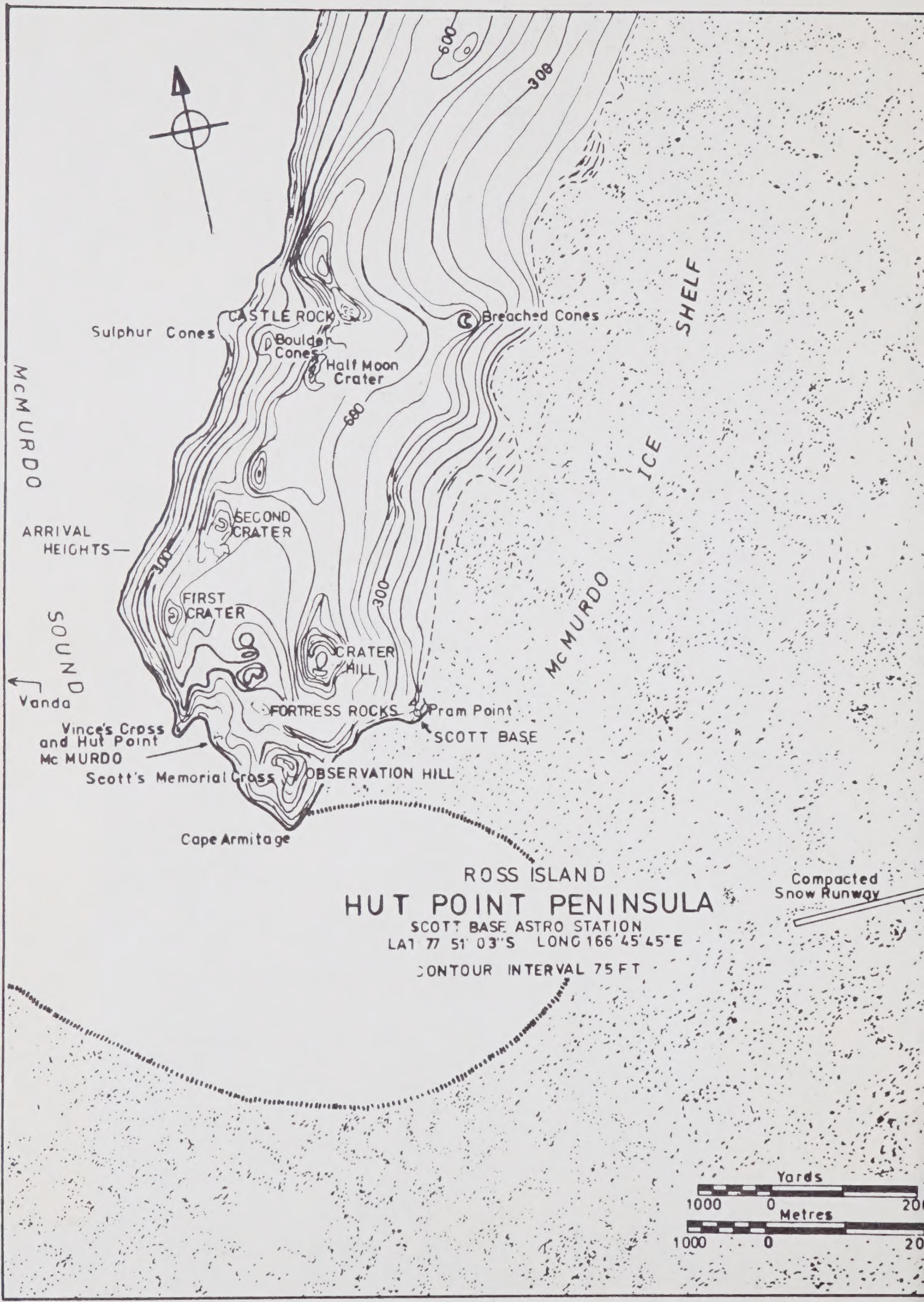
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Sulphur Cones
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SHELF
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ARRIVAL HEIGHTS
100
FIRST CRATER
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SOUND
CRATER HILL
Vanda
FORTRESS ROCKS
Pram Point
SCOTT BASE
Vince's Cross and Hut Point
Mc MURDO
Scott's Memorial Cross
OBSERVATION HILL
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ROSS ISLAND
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NEW ZEALAND ANTARCTIC RESEARCH PROGRAMME

1980/81

PLANNING AND OPERATION

The Ross Dependency Research Committee formulates the New Zealand Antarctic Research Programme. The Committee comprises representatives of Divisions of the Department of Scientific and Industrial Research, the Lands and Survey, the Dominion Museum, the Royal Society of New Zealand, New Zealand Universities, the Chiefs of Staff of the New Zealand Armed Forces, and the Department of Foreign Affairs. It is representative of all scientific disciplines with Antarctic interests.

Antarctic Division, DSIR, is responsible for detailed planning and implements the programme. The Division employs staff and obtains supplies and equipment for all Government projects. University projects are financed and equipped from University sources. The operation and control of all projects is directed by the Antarctic Division through the Officer-in-Charge, Scott Base.

SCOTT BASE

Scott Base opened on January 20, 1957 as a scientific station in support of the International Geophysical Year (IGY 1957/1958). The base also served as a staging point for the Commonwealth Trans-Antarctic Expedition of that year.

Sited at Pram Point on the southern tip of Ross Island, (latitude 77°50' S) Scott Base is only three kilometres from the main American base - McMurdo Station.

The number of base buildings has now increased from seven to eleven and all are interconnected by covered walkways. These allow free movement around the base without exposure to the weather, and the modular construction minimises the ever-present fire risk.

Ten men will winter-over at Scott Base in 1981. The team will comprise: the O.I.C., base engineer, electrician, mechanic, postmaster, post office technician, scientific officer, technician, chef and field leader/doghandler.

Base staff will increase to 24 including three at Vanda Station, during the summer. In all, there will be a total of 135 personnel involved in the summer scientific programme, construction activities and base operations.

SCOTT BASE REBUILDING PROGRAMME

Over the past 22 years, Scott Base buildings have been modified to accommodate the needs of the expanding New Zealand science programmes undertaken in Antarctica.

The base rebuilding programme, commenced in 1976/77 with construction of the bio-laboratory. Facilities provided within this complex include a scientific laboratory, lounge area, the base library and additional accommodation for 20 people. The base accommodates up to 60 persons.

Stage 2 of rebuilding was completed during the 1978/79 season with the commissioning of the new power house. Power supply is generated by two 135 KVA three phase Caterpillar Alternator units driven by Caterpillar 3306 diesel engines.

Last season, installation of the reverse osmosis - (desalination plant) into the power house complex was completed which will, when fully operational, give the base a fresh water supply of 16,000 gallons.

Stage 3A of the reconstruction programme will commence this summer, comprising a new ablutions block and accommodation facilities, designed to ultimately expand base accommodation for up to 80 persons.

The construction programme will be carried out by 16 specialist personnel from Antarctic Division, DSIR, Ministry of Works and Development and the N.Z. Army.

TRANSPORT

Until 1960 air support within Antarctica was provided by the Antarctic Flight of the Royal New Zealand Air Force. Since then generous air support has been given by the VXE-6 squadron of the United States Naval Support Force under Government agreement. In return base facilities are granted the Support Force in Christchurch and New Zealand provides the United States with operational assistance - e.g. N.Z. Army cargo handling teams are stationed in Christchurch and in the Antarctic at Williams Field, McMurdo Station and Pole Station.

Eleven RNZAF Hercules flights will constitute the main New Zealand contribution to the U.S./N.Z. logistics pool this season. As in the past two RNZAF helicopter crews will be attached to the VXE-6 squadron flying field missions in Antarctica.

Following the pattern of the past two seasons RAAF Hercules aircraft will again be contributing to the U.S./N.Z. logistics pool under a tripartite agreement which will allow Australian personnel to be air transported to the main Australian Antarctic base at Casey.

Ground Transport : Scott Base

1 D4 Caterpillar Tractor
1 920 Caterpillar FEL Tractor
4 Snow-Trac Vehicles
5 Snow-Tric Toboggans
4 Snow Cruise Toboggans
1 Landrover
1 Gnat
2 Dodge - 4 Wheel Drive One Ton Trucks
1 International Wheeled Tractor
1 International Crawler Tractor 500

1 Bedford Personnel Truck
1 Ford Personnel Truck
1 Toyota Landcruiser 4x4

2 Dog teams - sledge dogs have been a feature of New Zealand field party transport since the Trans-Antarctic Expedition of 1957. However motor toboggans introduced into the 1962/63 season have made long dog sledge journeys unnecessary. The "tin dogs" can cover greater distances in shorter time and haul heavier loads. The dog pack at Scott Base is now kept at about 20 - enough for two teams of nine dogs each, plus a few spares. The main functions of the dog teams now are for conducting the annual seal and penguin census, emergency, recreation and public relations purposes.

Ground Transport : Vanda Station

2 FE 35 Ferguson Tractors

RESEARCH ACTIVITIES

1. SCOTT BASE AND ARRIVAL HEIGHTS

Scott Base is an important link in a global chain of observing stations conducting research in geophysics, meteorology and seismology.

Continuous Scott Base Laboratory programmes, will this year include:

Seismology

Sited on rock and located near to Antarctica's major mountain chain extending from Cape Adare to beyond the Beardmore Glacier southward, Scott Base is of strategic importance in Antarctic seismology. Additions made to the science laboratory in 1962/63 permitted the setting up of new American equipment, one of 120 identical instruments which the United States Coast and Geodetic Survey has given to countries throughout the world. New Zealand is responsible for three other such stations: Wellington, New Zealand; Rarotonga, Cook Islands and Apia, Samoa.

Seismology is under the aegis of the Seismological Observatory, Geophysics Division, DSIR, Wellington.

Under an independent seismic programme being conducted by Dr Philip Kyle of Ohio State University, seismic recorders will be sited at various locations on Mount Erebus and data fed by radio telemetry to Scott Base. The recording programme will continue throughout the winter.

Meteorology

Routine daily climatological and surface synoptic observations, recording solar radiation and atmospheric turbidity measurements.

The N.Z. Meteorological Service will continue the Scott Base observing programme and make additional radiation measurements, including data analysis. Local climatological studies will also be made in conjunction with field parties, each of which is required to provide daily reports on location weather.

Weather observations will also be made from Vanda Station.

Ionospherics

Scott Base is one station in a world network of stations which continuously records the state of the ionosphere with a vertical incidence recorder. A panoramic ionosonde, designed and constructed in New Zealand, sweeps from 1-22 megacycles in 24 seconds at 15 minute intervals to provide data from Scott Base to be used for the prediction of radio operation frequencies. This programme is operated by the Geophysical Observatory, Physics and Engineering Laboratory, DSIR, Christchurch.

The University of Canterbury will this year complete the installation of ionospheric D-region observation equipment for operation and maintenance by wintering over scientific staff. For this programme, transmission equipment will operate from Scott Base with the receiver located at Arrival Heights.

Earth Currents

During the 1964/65 season a programme measuring electric currents in the earth was established at Scott Base, as this year was the International Year of the Quiet Sun. Solar flares then reached a minimum as compared with the International Geophysical Year in 1957/58. Two sets of electrodes sunk 10 ft. deep through the permafrost were spaced 4,000 ft. apart, one for the north-south reading and one for the east-west reading. This electric current study, which results from variations in the earth's magnetic field, is one method of observing solar and ionospheric activity which has important effects on radio communication. Although earth current observations ceased in October 1974, one line which acts as an indicator of disturbance was retained to monitor magnetic activity. This programme is under the aegis of the Geophysical Observatory, P.E.L., DSIR, Christchurch.

Geomagnetism

In this standard observatory activity, two independent recording systems are used:

(a) Wide Range three-component instrument
(b) Reduced sensitivity, three-component instrument

Both instruments have La Cour magnetographs. Weekly absolute observations are also being made with the aid of a proton precession magnetometer. Geomagnetism is under the aegis of the Geophysical Observatory, P.E.L., DSIR, Christchurch.

Micropulsations

This programme was commenced by ESSA, Boulder, U.S.A. The equipment involved was resited in December, 1970 and the programme jointly operated by ESSA and Geophysical Observatory, P.E.L. technicians. The programme records minute fluctuations of the earth's magnetic field caused by disturbances in the ionosphere.

Equipment was updated last season and the programme will continue for another 12 months with responsible authority now assumed by the University of Auckland.

Gravity Connection

Two guest scientists from the Geophysical Institute, Kyoto University, Japan will participate in the New Zealand programme this year to study gravity connection between New Zealand and Antarctica as part of their world wide research in this field.

Aluminium Corrosion

Scott Base staff will again install exposed aluminium strips on behalf of Canterbury University, Mechanical and Engineering Department.

Each year, the plates are returned to Christchurch for analysis and comparison with similar materials exposed at various industrial locations throughout New Zealand.

Respiratory Virology

A cooperative U.S./N.Z. programme commenced last season by Dr Elliott Dick of the University of Wisconsin and

Dr Lance Jennings of Christchurch as research assistant. The two components of the programme involves firstly the study of flu virus transmission and interruption amongst staff at McMurdo and Scott Base during an isolation period from late August to early October. Secondly is the study on the susceptibility of Antarctic winter over personnel to resist illness on their return to civilization.

Psychological Studies

A programme initiated by Dr Tony Taylor of Victoria University will continue this year, with the psychological testing of wintering personnel at Scott Base.

2. VANDA STATION

New Zealand's only base on the Antarctic Continent was built in 1968 to support the intensified study of the almost ice-free Dry Valleys. Vanda Station, 130 km west of Scott Base, is ideally situated for the support of summer field parties working in the Dry Valley area.

Vanda is basically a summer only station but scientific parties wintered over in 1969, 1970 and 1974. Research programmes were carried out in the fields of meteorology, seismology, aurora, upper air physics, geomagnetism and human physiology.

This year Vanda will again operate for the summer only and a N.Z. meteorological technician will make daily weather observations.

The station will continue to play its vital logistic, support and communications role for NZARP parties and U.S. helicopters operating in the Dry Valleys region.

Two meteorological scientists from State University of New York will also conduct studies from Vanda Station of the Aerosol Column and meteorological variations of Antarctic Aerosols.

3. CAPE BIRD

Bird Station was constructed by Scott Base personnel during the 1965/66 season. Following completion of studies on wildlife at Cape Royds, the Canterbury University Antarctic Biological Unit commenced a programme of studies on seals, Adelie penguins, McCormick skua gulls and their inter-relationships.

In the summer of 1971/72 a wet laboratory was built to facilitate the study of marine plankton and Benthic research. Bird Station will be occupied this year by scientists from Canterbury University during their research into the living resources of Antarctica which will be part of the International Biomass Study programme.

The station will also be used as a base for conducting the annual penguin census.

4. CAPE ROYDS

A combined biological laboratory and sleeping hut was erected in 1963 by Scott Base staff at Cape Royds, 36 km north of Scott Base on the western side of Ross Island.

This is the location of the most southerly Adelie penguin colony in the world. The rookery has been designated by SCAR and the Treaty Nations as a "Site of Special Scientific Interest".

Biologists from Canterbury University used the hut at Cape Royds for several summer seasons as headquarters for their studies on penguins, skuas and seals.

The hut has since been transported to the Wright Valley and integrated into the buildings of Vanda Station.

A smaller summer hut has been erected at Royds for visiting researchers and will be used again this season during the annual penguin census.

5. EMERGENCY HUTS

Emergency huts, fully provisioned, are maintained at Lake Fryxell, Asgard Range, Lower Wright Valley, Cape Evans and Cape Royds for use by field parties during the summer season.

FIELD PROGRAMME 1980/81

Scientific research programmes, sponsored by New Zealand Government Departments and four Universities will be undertaken over a wide range of disciplines, including geology, glaciology, hydrology, biochemistry, volcanology, marine biology, oceanography and plant physiology.

New Zealand will again provide support for and participate in a number of important international programmes involving scientists from Japan, United States of America, West Germany and Australia.

EVENT 1 : GLACIOLOGY AND HYDROLOGY

Ministry of Works and Development hydrologists will continue the monitoring programme carried out over past seasons in order to document both long and short term climatic variations in the Dry Valleys.

The flow regime of the Onyx River will be studied and lake level measurements taken of Lakes Vida, Vanda, House, Joyce, Bonney, Henderson, Hoare and Fryxell.

Ice thickness and ablation measurements will also be monitored on Lake Vanda.

Mass balance measurements will be continued on the Heimdall Glacier and both inland and coastal glaciers will be subjected to comparative ablation measurement.

EVENT 2 : GEOLOGICAL STUDIES : FERRAR GLACIER

This event, sponsored by Antarctic Division, DSIR, is part of a continuing programme to provide detailed geological mapping from the Koettlitz Blue Glacier region northward to the Dry Valleys.

A four-man expedition will undertake a structural and metamorphic analysis of basement rocks in the Ferrar Glacier. Geological studies will be made of both sides of the Ferrar Glacier as far as the Cavendish Icefalls at the confluence of the Taylor and Ferrar Glaciers.

The expedition will be joined by a scientist from the Institute of Nuclear Sciences, DSIR for a short period to obtain samples for potassium-argon dating.

EVENT 3 : SURVEY WORK

Two surveyors from Lands and Survey will provide survey assistance to six field events this season including lake levelling, Scott Base pressure roller and McMurdo Ice Shelf movement measurements. They will be involved with the mapping programme on Mt Erebus and site fixing for drill holes in the Taylor Valley.

At Scott Base, the surveyors will plot the position of a new power cable to Arrival Heights and fix levels and sitings for foundation pads for Stage 3 of the base rebuilding programme.

EVENT 4 : BIOCHEMICAL STUDIES - LAKE VANDA

Ecology Division, DSIR will conduct detailed biochemical/ limnological studies in Lake Vanda. They will be joined by Dr Paul Broady, a phycologist from the University of Melbourne, during the course of the study programme.

EVENT 5 : MT EREBUS VOLCANOLOGICAL STUDIES - INTERNATIONAL EVENT

New Zealand, American and Japanese scientists will again study eruptive phenomena around the summit of Mt Erebus.

The party will conduct paleomagnetic sampling around summit lava flows; seismic audio and magnetic studies which will become an integral part of the U.S. International Mt Erebus Seismic Study programme (IMESS) designed to obtain a longer space-time record of the seismicity of Mt Erebus.

Observations of the lava lake and petrological examination of volcanic ejecta will also be undertaken.

The summit area will be the subject of a precise survey programme in order to establish a basis for future annual observation to determine the nature of earth deformation associated with variations in the level of volcanic activity and for the production of a detailed contour map of the area.

EVENT 9 : MARINE GRAVITY AND SEISMIC PROFILING WESTERN ROSS SEA

Six scientists from Geophysics Division, DSIR, and Victoria University will conduct a marine gravity and seismic profiling study aboard the "Benjamin Bowring" on a 10 day cruise from New Zealand to Ross Island, McMurdo Sound.

EVENT 10 : RECONNAISSANCE OF NORTHERN VICTORIA LAND FOR 1981/82

A Hercules C130 reconnaissance flight, involving some New Zealand personnel, will be made over specified regions of Northern Victoria Land in order to determine suitable sites for C130 landings and helicopter operations likely to be associated with the proposed 1981/82 expedition to the region.

EVENT 11 : REMOTE SENSING - NORTHERN VICTORIA LAND

Utilising the same flight as Event 10, scientists from Physics and Engineering Laboratory, DSIR and Department of Lands and Survey will make observations to determine ice typing and enhancement processes over the Northern Victoria Land region.

EVENT 12 : BIOMASS STUDIES

Scientists from the Botany Department of Canterbury University will conduct biomass and nitrogen fixation studies in the Taylor Valley, Cape Bird and Mt Erebus regions. At Cape Bird, a penguin census will be taken as part of this programme.

EVENT 13 : BEACON STUDIES

Continuing studies made last season, Victoria University will this year continue with Canterbury University scientists to obtain samples of Permian and Triassic plant fossils and magnetic measurements to determine ancient pole positions. This research will be carried out in areas of Mounts Fleming, Crean and Bastion.

EVENT 14 : McMURDO SOUND SEDIMENTS - FAUNA AND FLORA

Victoria University scientists will collect sediment samples from the floor of McMurdo Sound in order to relate sediment and faunal content to present day geography.

EVENT 15 : BASEMENT STUDIES - VICTORIA UNIVERSITY

A study of mineralogical relationship between granitic and metamorphic rocks in the Miers Valley.

EVENT 16 : SEA ICE AND GLACIER TONGUE DYNAMICS

The University of Waikato will measure sea ice movement in McMurdo Sound caused by sea swell and aircraft landings. Research will also be undertaken into the calving mechanism of the Erebus Glacier tongue.

EVENT 17 : PLANT PHYSIOLOGY

Waikato University scientists operating in the Dry Valleys will study the physiology and productivity of plant communities and carry out microbiological sampling of Lake Fryxell, Don Juan Pond and Lake Vanda and scree plant sampling in the Lower Taylor Valley. An extension of this event will be a detailed study of algae in the Mt Erebus fumaroles.

EVENT 21 : DRY VALLEY MAGNETOSTRATIGRAPHY - INTERNATIONAL PROJECT

This event is sponsored by the U.S. National Science Foundation but involves a considerable New Zealand input in terms of science and survey personnel and equipment.

The project will study stratigraphy and age of surface units in the Eastern Taylor Valley and their correlation with upper strata recovered in earlier drilling programmes, DVDP 8 and 11.

EVENT 22 : INTERNATIONAL BIOMEDICAL EXPEDITION TO ANTARCTICA INTERNATIONAL PROJECT

Two New Zealand scientists will participate in this event.

EVENT 23 : PENGUIN CENSUS - CAPE ROYDS

Scott Base staff will conduct the annual observations and census study at Cape Royds which is designated, under the Antarctic Treaty provisions, as a Site of Special Scientific Interest.

Full details of the observations and census figures are reported to the Scientific Committee on Antarctic Research and the Treaty Nations.

EVENT 24 : SURVIVAL TRAINING

Antarctic Division, DSIR field personnel, all members of the Search and Rescue Unit, will provide survival training and instruction to all members of the New Zealand and United States Antarctic Research Programme.

EVENT 25 : PSYCHOLOGICAL STUDIES

A psychologist from Victoria University will continue psychological testing of Scott Base wintering personnel.

EVENT 26 : SEAL CENSUS - McMURDO SOUND

The annual Weddell seal population census in the Scott Base - Cape Royds region will be conducted by Scott Base staff.

EVENT 27 : JAPANESE ANTARCTIC RESEARCH EXPEDITION

Sponsored by Antarctic Division, DSIR and J.A.R.E.

Dr Tetsuya Torii and two assistants will conduct their 14th successive year of geological and geochemical studies in the Dry Valleys region.

EVENT 28 : WORKER VISITORS

A number of short term worker visitors from various Government Departments will visit Scott Base and Vanda Station during the season to service existing installations.

EVENT 30 : V.I.P. VISITOR GROUPS

Two groups of V.I.P. guests of Antarctic Division, DSIR, will visit Scott Base and Vanda Station and local field parties during the season.

EVENT 32 : NATIONAL FILM UNIT

The National Film Unit will again visit Scott Base and NZARP field parties to complete a documentary film on New Zealand Antarctic activities.

HISTORIC HUT RESTORATION

On Ross Island there are three historic huts which since 1960 have been excavated and restored to an "as was" condition by New Zealand Antarctic Society volunteers and DSIR personnel, with American assistance. In 1960/61 the hut at Cape Evans, which was Captain Scott's headquarters for his last tragic expedition in 1910/13, and was the home for the Ross Sea component of Shackleton's Trans-Antarctic Expedition of 1914/17, was restored. Also the hut at Cape Royds, which was Shackleton's headquarters for his 1907/09 expedition, was made weatherproof during the 1960/61 season. Finally, in the

1963/64 season, restoration work was commenced on Scott's 1901/04 expedition hut at Hut Point. Maintenance and restorative work is normally carried out annually by New Zealand Antarctic Society volunteers. However, this year, with the emphasis being placed on the base rebuilding programme, inspection of the huts will be made under the direction of the Officer-in-Charge and necessary repairs and maintenance work carried out.

At Cape Adare, at the northern tip of Victoria Land, are the two huts built by C.E. Borchgrevink in 1898/99 and the remains of Scott's Northern Party's hut of 1911. Scott's hut is beyond repair, but it is hoped that Borchgrevink huts will be restored at some time in the future.

REPORT ON NEW ZEALAND ANTARCTIC RESEARCH PROGRAMME FOR 1979/80 SUMMER AND 1980 WINTER

SCOTT BASE AND ARRIVAL HEIGHTS

At Scott Base continuous scientific programmes have been maintained in ionospheric physics, geomagnetism, meteorology, seismology, earth currents and atmospheric potential gradient.

The Arrival Heights micropulsation programme has also been maintained but the studies in auroral physics and ionospheric absorption were discontinued at the conclusion of the summer season.

Importantly, the reverse osmosis desalination plant was installed into the new power house commissioned last season. This work was completed on schedule and the unit was test operated but final adjustments to the water supply system will be carried out at the commencement of the 1980/81 season.

Landscaping and site preparation for the next construction stage of the base rebuilding programme was completed during the summer. General base maintenance including the fitting of a new hangar door was carried out by base and Ministry of Works staff.

Eleven men are wintering at Scott Base maintaining the continuous science programme. They constitute the 24th New Zealand wintering party in Antarctica.

Throughout the winter months base staff have prepared field equipment and vehicles for operation during the 1980/81 summer season.

VANDA STATION

Vanda Station, operated as a summer support base from October 24, 1979 - January 25, 1980 was staffed by three men during the season. A limited meteorological programme was successfully completed and elementary hydrological and glaciological measurements taken in the immediate vicinity.

During the season, Vanda staff provide seismic measurements taken on Lake Vanda to assist one of the Japanese events attached to the New Zealand programme. Two remote automatic recording wind stations were positioned, one at Bull Pass, the other at the western end of Lake Vanda.

For the nine NZARP field parties and the United States helicopter operations, Vanda Station again provided vital logistics and communications support.

EVENT 1 : GLACIOLOGY AND HYDROLOGY

Ministry of Works and Development hydrologists completed their programme to determine the sources of the Onyx River. In total 16 flow measurements were made and preliminary results indicate that tributary channels do not contribute as much to the Onyx as previously thought. Lake levels were monitored on Lakes House, Joyce, Bonney, Henderson, Hoare, Fryxell, Vida and Vanda. Ice ablation and thickness measurements were continued on Lake Vanda throughout the summer. Mass balance measurements were made on the Heimdall and Wilson Piedmont Glaciers and ablation poles were measured on the Clark, Lower Wright and Upper Wright Glaciers. Phototheodolite surveying of the Commonwealth Glacier completed 5 years study of the glacier variations.

EVENT 2 : GEOLOGICAL STUDIES - BLUE GLACIER EXPEDITION

The expedition successfull completed the programme of detailed geological mapping of the Blue Glacier region involving a structural/metamorphic analysis of the rock outcrops. This work was a continuation of the studies made in the Koettlitz Glacier region during the 1977/78 season.

EVENT 3 : SURVEY WORK

Surveyors from Lands and Survey carried out a number of survey projects throughout the summer providing assistance to field events in the Dry Valleys, at the MSSTS Drilling Site and the summit of Mount Erebus. Survey work was also completed on the building sites at Scott Base and movement of the Ross Ice Shelf was monitored.

EVENT 5 : MT EREBUS OBSERVATIONS - INTERNATIONAL PROJECT

This event was undertaken on a reduced basis and comprised a team of New Zealand and American scientists. Observations of current and past activity from the Erebus crater were made, seismic activity recorded and final surveys made for the preparation of a topographic map of the summit region.

EVENT 8 : SUPER COOLED WATER

Temperature profile studies were conducted by the Oceanographic Institute from a location 8 km from Pram Point, Ross Island. Some 14 observations were made at 12 hourly intervals to a depth of 300 metres using an internally recording bathythermograph containing quartz crystal oscillators as temperature sensing devices.

EVENT 9 : PHYTOPLANKTON SAMPLING

An Oceanographic Institute scientist conducted this programme sampling water borne and sedimented hard shell plankton beneath the sea ice in McMurdo Sound.

EVENT 11 : McMURDO SOUND SEDIMENT AND TECTONIC STUDY (MSSTS)

The MSSTS programme was jointly sponsored by Antarctic Division, DSIR, Victoria University and Geophysics Division, DSIR. Guest scientists involved in the project represented Japanese, West German, Australian and United States scientific institutions.

Drilling operations commenced on October 21, 1979 and because of premature movement of the sea ice, was abandoned on November 22, 1979. However, drilling did reach a depth of 229.6 metres into the sea floor and some 73 core samples obtained for detailed analysis. Studies of the core samples are continuing in an attempt to relate the off-shore sedimentary sequence to the inland strata previously cored in the Trans Antarctic Mountains.

EVENT 11a : BEACON STUDIES

The Mt Fleming area was revisited to complete a study of the Weller Coal measures initiated during the 1978/79 season. The measurement data obtained completes the detailed three dimensional coverage of the outcrops necessary to determine the dispositional history of the Weller Coal measures. Detailed geological mapping and sampling was carried out at Horseshoe Mountain and further studies are being made of the sandstone samples to determine minerological changes and the relationship between sandstone texture and sedimentary structures in the region.

EVENT 11b : CENOZOIC STUDIES

Guest Australian geologists made a study of the Coombs Hills for evidence of pre-Pleistocene lodgement tills. A major find was the uncovering of a fossil striated pavement at over 2800 metres on Mt Brooke which together with other evidence from Mt Feather, strongly suggests the East-Antarctic Ice Sheet in Southern Victoria Land, predated the Victoria Orogeny.

Granitic basement rocks were also sampled in the Bull Pass - Lake Vida region for fission track investigation.

EVENT 11c : SLOPE PROCESSES

Detailed mapping of moraines in the Pearce Valley was undertaken by a party from Victoria University.

EVENT 12 : SEISMIC PROFILING - McMURDO SOUND

Scientists from the Geophysics Division, DSIR, and Victoria University conducted a series of seismic surveys in McMurdo Sound. A valuable amount of seismic data and a good bathymetric record were obtained. The Beaufort Island - Granite Harbour leg in particular gave a good seismic record.

EVENT 13 : GRAVITY AND MAGNETIC SURVEY - McMURDO SOUND AND TAYLOR VALLEY - VICTORIA UNIVERSITY

A detailed gravity traverse was completed down Taylor Valley from Northwest Mountain to the sea with stations at 1 to 3 km intervals. Gravity readings were also made at approximately 10 km spacings in the Lower Ferrar and Blue Valleys and on Dailey Islands.

EVENT 15 : BIOLOGICAL STUDIES - ROSS ICE SHELF

The Zoology Department, Canterbury University, continued their study of the primary productivity in the water column and the dynamics of the pelagic ecosystem at the edge of the Ross Ice Shelf.

Earlier in the season, a party from the expedition conducted the annual Adelie penguin and skua census at Cape Bird.

EVENT 16 : INVESTIGATION OF THE NORMAL AND DISTURBED IONOSPHERIC D-REGION

The 1979/80 programme undertaken by the Physics Department, Canterbury University, consisted of the design, construction, testing and operation at Arrival Heights, of all electronic receiving and data recording equipment.

This programme when fully operational is expected to continue for up to 12 years.

EVENT 20 : PSYCHOLOGICAL STUDIES

Professor Tony Taylor of Victoria University continued gathering psychometric data from studies made with cooperation of Scott Base wintering personnel.

EVENT 21 : SALINE LAKE GEOCHEMISTRY AND QUARTERNARY STUDIES

Science programmes undertaken by Waikato University included the study of the thin beds of limestone found in the sediments of present and former lakes and the study of sediments and seasonal changes in the carbonate chemistry of Lake Fryxell. The unit also continued the study of the glacial history of the McMurdo Oasis by the dating of lacustre carbonates, using a new diamond drilling technique.

EVENT 22 : STUDIES OF ENDOLITHIC AND SUBLITHIC PLANT COMMUNITIES

Experiments were also undertaken by Waikato University involving the study of the ecology and growth requirements of the Dry Valley plant communities. For this experiment a greenhouse was erected and the feasibility demonstrated, of growing food crops under Antarctic conditions. Introductory studies were also made on fumerole plants of the Mt Erebus crater rim.

EVENT 24 : SURVIVAL TRAINING

Antarctic Division, DSIR, specialist field personnel provided essential survival training and instruction in snowcraft to all field party members of the New Zealand and United States Antarctic Research Programmes.

EVENT 25 : ALUMINIUM CORROSION

The continuation of the study programme on corrosion of aluminium strips was carried out by Scott Base staff on behalf of Canterbury University's atmospheric corrosion research.

EVENT 26 : GEOLOGICAL EXPEDITION - OHIO RANGE, HORLICK MOUNTAINS

This expedition was sponsored by the Canterbury Museum and joined by two scientists from the U.S. Geological Survey.

A detailed sedimentological and palaeocological examination was made of the Devonian Horlick Formation which included the finding of important rock sequences containing marine fossils.

EVENT 27 : JAPANESE ANTARCTIC RESEARCH EXPEDITION

Dr T. Torii again led a Japanese expedition for the 13th consecutive year - to continue geological and geochemical studies in the Dry Valleys region. During the early part of the season Dr Torii also participated in the MSSTS drilling programme.

EVENT 28 : NATIONAL FILM UNIT

Members of the National Film Unit completed the filming of New Zealand Antarctic activities. The finished product will be for national and international television release and libraries.

EVENT 29 : WORKER VISITORS

A number of short term worker personnel from various New Zealand Government Departments visited Scott Base and Vanda Station to service existing installations.

EVENT 30 : DSIR - ANTARCTIC DIVISION STAFF

Representatives from various sections of Antarctic Division visited Scott Base and Vanda Station to assist with operations and administration.

EVENT 31 : PENGUIN CENSUS - CAPE ROYDS

Scott Base staff completed the annual census at Cape Royds, designated a Site of Special Scientific Interest. Details of observations, census figures etc. are annually reported to SCAR and all Treaty Nations.

EVENT 32 : SEAL CENSUS - McMURDO SOUND

The annual seal population census in the McMurdo Sound/ Ross Island region was completed by Scott Base staff.

EVENT 36 : YOUTH GROUP VISIT TO SCOTT BASE

Two Youth Group representatives, from the Boys Brigade and Scouts Association, spent one month at Scott Base. They participated in general base duties and were able to visit Vanda Station and other adjacent sites of interest.

EVENT 38 : PHYSIOLOGICAL ADAPTATIONS OF ANTARCTIC ECTOTHERMS

The Zoology Department, Auckland University, successfully completed their planned programme of study into neural adaptations to cold and respiratory adaptation in Antarctic fish.

Recordings obtained of muscle contraction, electromyogram and intracellular potentials and data from the respiratory research is now being analysed in order to better understand metabolic control in Antarctic ectotherms.

EVENT 40 : INTERNATIONAL ELLSWORTH MOUNTAINS PROJECT

Two New Zealand scientists from the Soil Bureau participated in this major U.S. National Science Foundation earth science project.

In order to further study soil development in the Ellsworth Mountains and in particular to study distribution and chemistry of the salts within the soils, 23 soil profiles were described and sampled and over 100 samples collected for subsequent examination.

THE FUTURE

The New Zealand Government's policy of continuing its Antarctic activities at approximately the same level is likely to continue for some time to come.

Scott Base is an integral part of the chain of international stations that provides global monitoring of many important disciplines in earth and atmospheric sciences and New Zealand is fully committed to continuing to implement these programmes.

As a result of Recommendations made recently at Antarctic Treaty Consultative Meetings, further summer field programmes are likely to shift in emphasis to implementing scientific programmes that should provide information on the possible presence of mineral resources in the Antarctic. Increasing attention is also likely to be given to the study of the complete marine eco-system of the Antarctic, its marine living resources, and the question of possible exploitation of fish and krill.

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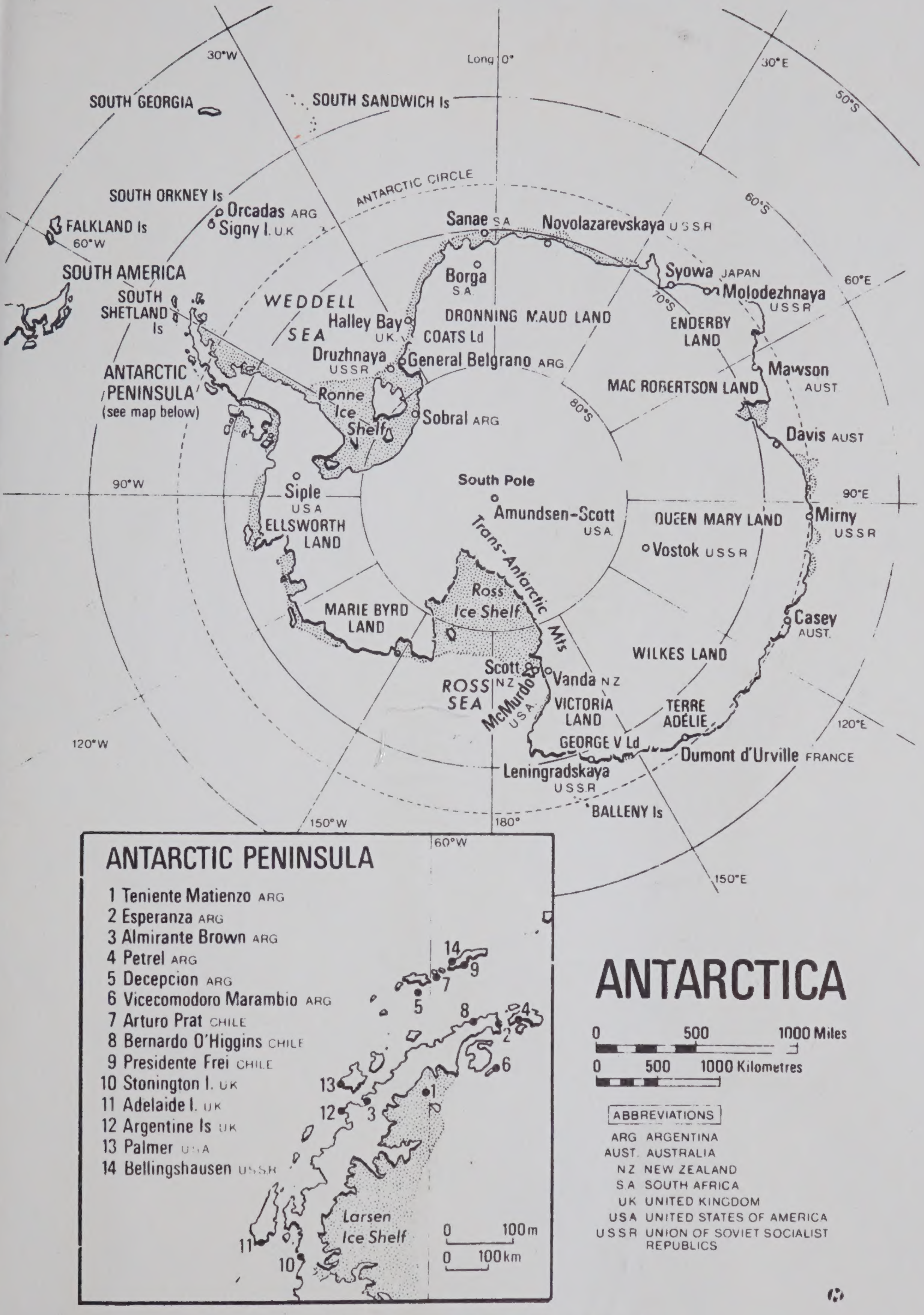

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